

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Appln. No.: 10/630,796
Attorney Docket No.: Q71412

REMARKS

The Office Action of June 18, 2004 has been received and its content carefully considered.

Claims 1 to 12 are all the claims pending in the application, prior to the present amendment.

The Examiner has indicated that claims 3 and 9 contain allowable subject matter.

Claims 6 and 12 have been rejected under the second paragraph of 35 U.S.C. § 112 as indefinite.

The Examiner sets forth two reasons for this rejection. Applicants discuss each reason below.

The Examiner states that in claim 6, the term "fine" is indefinite.

In response, applicants have amended claim 6 to delete the term "fine crystal structure".

The Examiner states that in claim 12, the term "single pole type head" is indefinite because of the use of the word "type".

In response, applicants have amended claim 12 to delete the word "type".

In view of the above, applicants submit that claims 6 and 12 comply with the requirements of the second paragraph of 35 USC § 112 and, accordingly, request withdrawal of this rejection.

Claims 1, 2, 5, 6, 10 and 11 have been rejected under 35 U.S.C. § 103(a) as obvious over U.S. Patent 6,524,724 to Cheng et al in view of U.S. Patent 6,537,638 to Do et al.

In response, applicants have amended claim 1 to incorporate the recitations of claim 3, which the Examiner has indicated contains allowable subject matter. Applicants have canceled claim 3 and amended claim 11 to also incorporate the recitations of claim 3.

In view of the above, applicants submit that claims 1, 2, 5, 6, 10 and 11, and all the claims dependent thereon are allowable and, accordingly, request withdrawal of this rejection.

In addition, applicants have added new independent claims 13 and 14. Applicants submit that claims 13 and 14 are patentable over Cheng et al and Do et al.

Claim 13 contains the recitations of original claims 1 and 7. In claim 13, an intermediate film is provided between the orientation control film and the perpendicular magnetic film. The film construction of claim 13 includes a Co based orientation control film, a CoCr based intermediate film, and a perpendicular magnetic film.

In Cheng et al, the layer construction can comprise an underlayer (Cr based layer), an intermediate layer (CoCr based layer), and a magnetic layer (Co based layer). See column 3, lines 28 to 30 and column 4, lines 56 to 57. The underlayer of the Cheng et al is formed by a Cr alloy, and the crystal form of the alloy is cubic. Because of this crystal form, the Cr underlayer of Cheng et al cannot orient the hexagonal magnetic layer, and the Cheng et al intermediate layer, which is of CoCr alloy, must have the role of the orientation control layer in Cheng et al.

On the other hand, the intermediate layer of claim 13 has a role in carrying out the orientation of the orientation control film. The first layer on the orientation control film does not orient very well. Multiple layers are needed to orient the crystal face perfectly on the orientation control film. The intermediate film of claim 13 gradually changes orientation from the side of

the orientation control film to the perpendicular magnetic film, and then the perpendicular magnetic film is oriented perfectly from the first layer adjacent to the intermediate film.

Applicants set forth the following table to illustrate the differences between claim 13 and Cheng et al.

Claim 13		Cheng et al	
Magnetic Film Co (Hexagonal)		Magnetic Layer Co (Hexagonal)	
Intermediate Film CoCr alloy (Hexagonal)	Transmit the orientation	Intermediate Layer CoCr, CoCrPt, etc. (Hexagonal)	Orientation Control
Orientation Control Co Alloy Film (Hexagonal)	Orientation Control	Underlayer Cr Alloy (Cubic)	

The film construction of claim 13 and that of Cheng et al are different, and the effect that a perfect oriented magnetic film is formed from the first layer of the magnetic film is obtained in the invention of claim 13. Applicants submit that claim 13 is not obvious from the teachings of Cheng et al.

Further, the layer construction of Do et al does not have a construction such as that of claim 13.

In view of the above, applicants submit that claim 13 is patentable over Cheng et al and Do et al.

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Appln. No.: 10/630,796
Attorney Docket No.: Q71412

Turning now to claim 14, it contains the recitations of original claims 1, 7 and 9. As stated above, the Examiner has indicated that claim 9 contains allowable subject matter. Accordingly, applicants submit that new claim 14 is allowable.

Claim 12 has been rejected under 35 U.S.C. § 103(a) as obvious over Cheng et al in view of Do et al, and further in view of Tomiyasu et al.

In response, applicants have amended claim 12 by incorporating the recitations of claim 3. As noted above, the Examiner has indicated that the subject matter of claim 3 is allowable.

In view of the above, applicants submit that claim 12 is allowable over Cheng et al, Do et al and Tomiyasu et al and, accordingly, request withdrawal of this rejection.

Claims 1, 4, 7, 10 and 11 have been rejected under 35 U.S.C. § 103(a) as obvious over Tomiyasu et al in view of Do et al.

In response, as discussed above, applicants have amended claim 1 to include the allowable subject matter of claim 3, and have amended claim 11 to include the recitations of claim 3. Accordingly, applicants submit that claims 1, 4, 7, 10 and 11, and all the claims dependent thereon are allowable and, therefore, request withdrawal of this rejection.

Turning now to claim 13, the magnetic recording medium of claim 13 includes a Co based orientation control film (hexagonal), a CoCr based intermediate film (hexagonal), and a perpendicular magnetic film (hexagonal), successively. As discussed above, the intermediate film of claim 13 transmits the orientation of the orientation control film. Further, the crystal system of each film is desirably the same, considering the orientation. These three films of claim

13 are hexagonal. Therefore, a perfect orientation of the magnetic film is obtained because of the existence of the intermediate film.

In Tomiyasu et al, the magnetic recording medium is formed from a seed layer (the Examiner asserted that this layer corresponds to the orientation control film of the present invention), an underlayer which is a Cr or a Cr alloy (cubic), an intermediate layer of CoCr or CoCr Nb (hexagonal) or the like, and a magnetic layer (hexagonal), successively.

The seed layer in Tomiyasu et al controls the crystal grain diameter of the Cr or Cr alloy underlayer. See column 4, lines 50-56. On the other hand, the orientation of the magnetic layer Tomiyasu, et al is controlled by the intermediate layer. See column 6, lines 51-54 of Tomiyasu et al. When the magnetic layer is directly on the intermediate layer (corresponding to the orientation control film of claim 13), the first layer of the magnetic layer does not orient very well, unless steps are taken to obtain better orientation as in the invention of claim 13. Furthermore, in Tomiyasu, et al, a cubic system film is provided between the intermediate film and the seed layer. This different crystal system disturbs the orientation of the magnetic film.

Applicants set forth the following table to illustrate the differences between claim 13 and Tomiyasu et al.

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Appln. No.: 10/630,796
Attorney Docket No.: Q71412

Claim 13		Tomiyasu et al	
Magnetic Film Co (Hexagonal)		Magnetic Layer Co (Hexagonal)	
Intermediate Film CoCr alloy (Hexagonal)	Transmit the orientation	Intermediate Layer CoCr, CoCrNb, etc. (Hexagonal)	Orientation Control
Orientation Control Co Alloy Film (Hexagonal)	Orientation Control	Underlayer Cr or Cr Alloy (Cubic)	Improving Magnetic Characteristic
		Seed Layer CoTi, CoHf, etc. (Hexagonal)	Grain Size Control

The film construction of claim 13 and that of Tomiyasu et al are different, and the effect that a perfectly oriented magnetic film is formed from the first layer of the magnetic film is obtained in the invention of claim 13. Accordingly, applicants submit that claim 13 is not obvious over Tomiyasu et al.

Further, the layer construction of Do et al does not have a construction such as that of claim 13.

In view of the above, applicants submit that claim 13 is patentable over Tomiyasu et al and Do et al.

Claim 8 has been rejected under 35 U.S.C. § 103(a) as obvious over Tomiyasu et al in view of Do et al, and further in view of Cheng et al.

Claim 8 is a dependent claim, which depends from claim 1, which now includes the allowable subject matter of claim 3. Accordingly, applicants submit that claim 8 is allowable over these references.

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Appln. No.: 10/630,796
Attorney Docket No.: Q71412

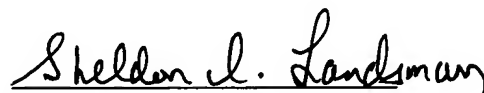
Claim 12 has been rejected under 35 U.S.C. § 103(a) as obvious over Tomiyasu et al in view of Do et al and further in view of Tomiyasu et al.

Applicants have amended claim 12 in the same manner they amended claim 1, and submit that claim 12 is patentable over the cited prior art.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



Sheldon I. Landsman
Registration No. 25,430

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE

23373

CUSTOMER NUMBER

Date: September 20, 2004